

Evidence is also presented that such plants as *Pteris aquilina* and *Pinus* often succeed in competition owing to their dead foliage excluding the light from their competitors, causing etiolation and decay.

In a more recent paper FARROW²³ has examined the retrogression begun by rabbits and continued by sand blasts. This retrogression shows exactly the reverse order of the succession inaugurated by irrigation, being particularly noticeable in the *Agrostis vulgaris* giving place to *Festuca ovina* wherever the sand blast became intensive. Once begun, bare areas tend to increase, the sand assisting in destroying the vegetation both by direct attack and by removing the substratum, leaving clumps of grass upon the tops of small hummocks which are being constantly undermined. With the checking of wind erosion in such bare areas *Polytrichum* and *Cladonia* become agents of stabilization and revegetation.—GEO. D. FULLER.

Photosynthesis.—OSTERHOUT and HAAS²⁴ summarize as follows a piece of work on the dynamics of photosynthesis. "*Ulva* which has been kept in the dark begins photosynthesis as soon as it is exposed to sunlight. The rate of photosynthesis steadily increases until a constant speed is attained. This may be explained by assuming that sunlight decomposes a substance whose products catalyze photosynthesis or enter directly into the reaction. Quantitative theories are developed to account for the facts." The rate of photosynthesis was determined by the rate at which a portion of *Ulva* rendered sea water basic to phenolphthalein. Since the dissociation of carbonic acid is very slight, change of reaction is a very crude way of measuring the amount present. There is also the possibility of other exchanges of more strongly dissociating materials that could modify the reaction of the water. In the face of excellent and very accurate methods for the quantitative determination of carbon dioxide it seems hardly justifiable to use this questionable method for a study of either respiration or photosynthesis. It is also doubtful whether sufficient regard has been given to other possible limiting factors of the rate of photosynthesis in these experiments. If, in spite of the defects of experimentation, the general conclusion proves true, it is a contribution of great significance and aids in confirming WILLSTÄTTER's view that the presence of a catalyzer is a common internal limiting factor to the rate of photosynthesis.—WM. CROCKER.

Organic plant poisons.—BRENCHLEY²⁵ finds hydrocyanic acid very toxic to pea and barley seedlings in water cultures. Hydrocyanic acid in concentrations of 1 part to 100,000 proved rather quickly fatal for peas and somewhat

²³ FARROW, E. P., On the ecology of the vegetation of Breckland. V. Characteristic bare areas and sand hummocks. Jour. Ecology 6:144-152. 1918.

²⁴ OSTERHOUT, W. J. V., and HAAS, A. R. C., Dynamical aspects of photosynthesis. Proc. Nat. Acad. Sci. 4:85-91. 1918.

²⁵ BRENCHLEY, WINIFRED E., Organic plant poisons. I. Hydrocyanic acid. Ann. Botany 31:447-456. 1917.